Device Tree Tools Status

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scripts/dtc/dtx_diff

dtx_diff compares device trees in various formats

- source (.dts and the .dtsi includes)

- dtb (binary blob)

- file system tree

merged in 4.6-rc1

examples and use shown in

Solving Device Tree Issues - part 1
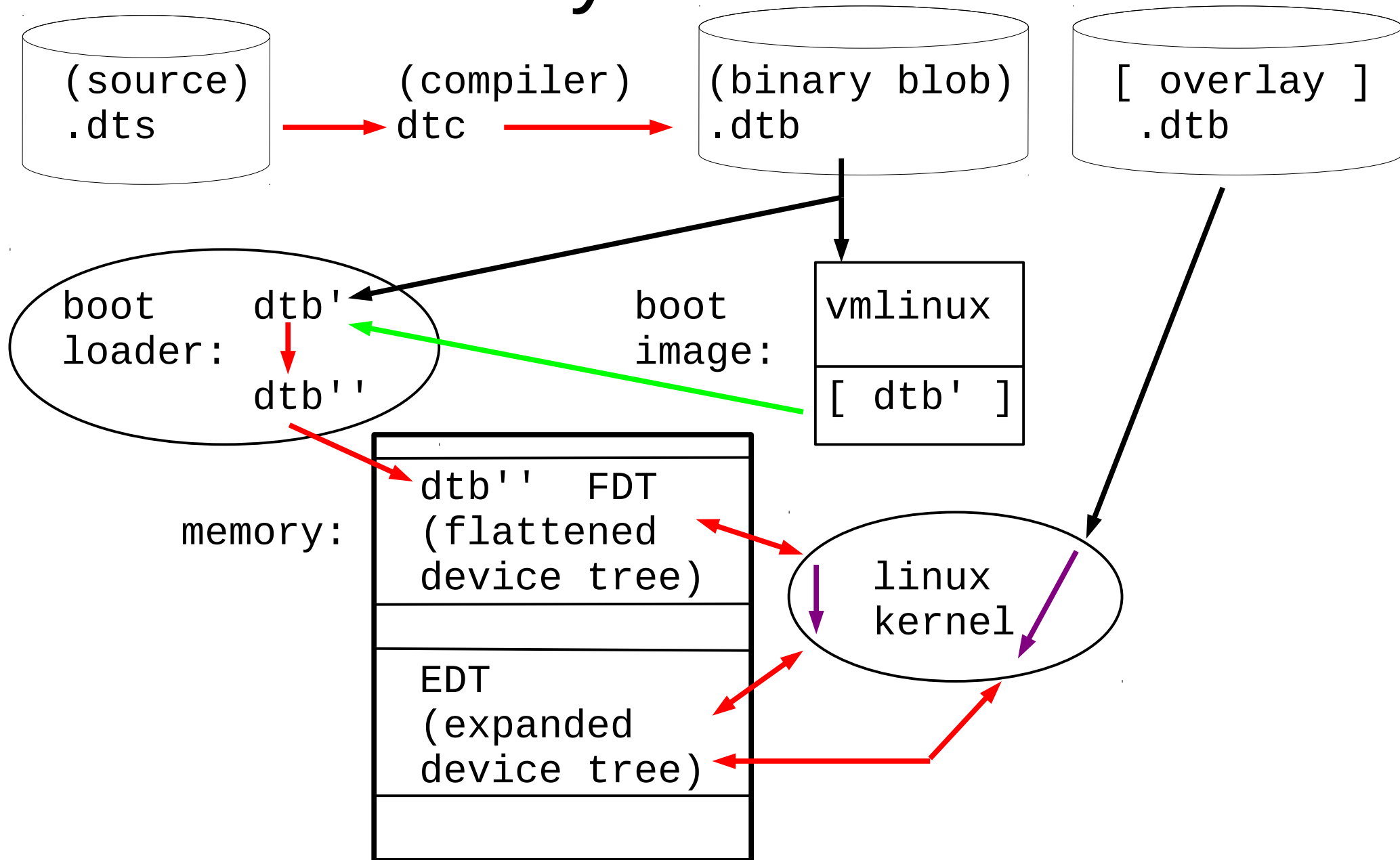elce 2016

DT data life cycle

```
device tree source
   .dts  file
   .dtsi files
   .h    files
```

device tree
on booted
target

DT data life cycle

(source)
.dts

(compiler)
dtc

(binary blob)
.dtb

[overlay]
.dtb

boot
loader: dtb'

            dtb''

memory:

boot
image:

vmlinux

[dtb']

dtb'' FDT
(flattened
device tree)

EDT
(expanded
device tree)

linux
kernel

scripts/dtc/dtx_diff

Process one source device tree

- pre-process include file directives and create
resulting source (that is, converts .dts files
and included .dtsi files into a single .dts)

scripts/dtc/dt_to_config

Input: device tree
Input: kernel config (optional)

 - Find drivers matching node compatible string(s)
 - Find kernel config option(s) to build driver
 - Check whether kernel config option is set properly
 - Generate kernel config file fragments

merged in 4.8-rc1

examples and use shown in

Solving Device Tree Issues - part 2
LinuxCon Japan 2016

Others from Part 1

Tools that remain proof of concept:

    dtc --annotate

    dt_node_info

    dt_stat

scripts/dtc/dt_prop

Compare properties accessed on target system against a device tree (DTx)

prototype in final test, RFC "soon"

patches and programs available on elinux.org

examples and use shown in

    Solving Device Tree Issues - part 3
    elce 2016

Kernel Code Perspective

Did my driver or a framework

- read a property value

- attempt to read a property value that did not exist

- not attempt to read a property that exists in the device tree

Device Tree Source Perspective

Does the device tree source contain

- the necessary properties

- properties that should not be present

- properties that are not used by the kernel

Resources

http://elinux.org/Device_Tree_presentations_papers_articles

http://elinux.org/Device_Tree_Reference

devicetree: Kernel Internals and Practical Troubleshooting
  Frank Rowand, ELCE 2014

  http://elinux.org/ELC_Europe_2014_Presentations

Resources

dtx_diff

Solving Device Tree Issues - Part 1:
Frank Rowand, elce 2015
http://elinux.org/images/0/04/Dt_debugging_elce_2015_151006_0421.pdf

Supporting material for: Solving Device Tree Issues - Part 1:
http://elinux.org/Device_Tree_frowand

dt_to_config

Solving Device Tree Issues - Part 2:

Frank Rowand, LinuxCon Japan 2016

http://elinux.org/images/5/50/Dt_debugging_part_2.pdf

Resources

dt_prop

Solving Device Tree Issues - Part 3:
Frank Rowand, elce 2016
http://elinux.org/images/e/e5/Dt_debugging_part_3.pdf

Supporting material for: Solving Device Tree Issues - Part 3:
kernel patches
scripts/dtc/dts_diff
scripts/dtc/dt_prop
http://elinux.org/Device_Tree_frowand